

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 40

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte BERNHARD GUTSCHE, LUTZ JEROMIN, EBERHARD PEUKERT,  
LEVENT YUEKSEL, KURT ADRIAN and HEINZ BOLLWEG

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Appeal No. 1996-4087  
Application No. 08/259,362

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ON BRIEF

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Before GARRIS, PAK, and LIEBERMAN, Administrative Patent Judges.

LIEBERMAN, Administrative Patent Judge.

**DECISION ON APPEAL**

This is an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 13 through 21, 36 and 37 which are all the claims in the application.

**THE INVENTION**

According to appellants the invention is directed to a discontinuous esterification, transesterification, transacetalization or an acetal forming reaction at elevated temperatures, using a fixed bed catalyst. The steps of the reaction comprise:

- A. forming a reaction mixture of the components in a first reaction zone,
- B. transferring the reaction mixture through a fixed bed catalyst, which constitutes the second reaction zone,
- C. heating the reaction mixture to a desired reaction temperature suitable to remove one or more volatile reaction products in a third reaction zone,
- D. continuously circulating the reaction mixture through each of the reaction zones until the desired degree of reaction completion is obtained.

### THE CLAIMS

Claim 13 is illustrative of appellants' invention and is reproduced below.

13. A discontinuous process for a heterogeneously catalyzed chemical reaction which is an esterification reaction, a transesterification reaction, a transacetalization reaction, or an acetal-forming reaction at an elevated temperature in which at least one heat sensitive reaction product is formed comprising the steps of:

- A. forming a reaction mixture of the components to be reacted in a reaction zone,
- B. passing the reaction mixture through a second zone containing a fixed-bed catalyst,
- C. passing the reaction mixture through a third zone in which the reaction mixture is heated to the desired reaction temperature and in which the more volatile reaction product or products are removed from the reaction mixture, and

- D. continuously circulating the reaction mixture in succession through the reaction zone, the second zone, and the third zone until the reaction has reached the desired degree of completion.

### THE REFERENCES OF RECORD

As evidence of obviousness, the examiner relies upon the following references.

Buettgen et al. (Buettgen)	5,110,508	May 5, 1992
(French Patent Application) Trambouze <sup>1</sup>	2,293,238	Jul. 2, 1976

### THE REJECTIONS

Claims 13 through 21, 36, and 37 stand rejected under 35 U.S.C. § 103 as being unpatentable over Trambouze in combination with Buettgen.<sup>2</sup>

### OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with the appellants that the aforementioned rejection under 35

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<sup>1</sup>The examiner, in error, cites Trambouze as Patent no. 1,526,977. See Answer, page 2. No such Trambouze patent is cited of record. The Trambouze reference cited of record appears in an information disclosure statement, filed November 10, 1993, and is acknowledged by the examiner in an Office action dated March 6, 1995. Accordingly, we cite the french patent application.

<sup>2</sup> We refer in our decision to the translation of French Patent Application No. 2,293,238 translated by the Ralph McElroy Translation Company for the United States Patent and Trademark Office in October 1996.

U.S.C. § 103 is not well founded. Accordingly, we will not sustain the examiner's rejection.

"[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a prima facie case of unpatentability." See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The examiner relies upon a combination of Trambouze and Buettgen to reject the claimed subject matter and establish a prima facie case of obviousness.

The examiner recognizes that there is a deficiency in the process of Trambouze in that it does not teach a "step for the removal of the heat-sensitive product after it is produce[d]." See Answer, page 3. Nonetheless the examiner concludes that, "[t]he combination of the removal step of Buettgen et al. with the reaction step of Trambouze renders the instant process obvious absent evidence of unexpected results." Id. We disagree.

On the record before us, the examiner's conclusion of obviousness is inappropriate. Appellants' invention is directed to equilibrium reactions wherein the more readily volatile products(s) of the reaction are removed following heating the reaction mixture to a desired reaction temperature, such that the reaction equilibrium is shifted toward the product side. The requirement for removal of a volatile product is found in step C of the claimed subject matter which states that, "the reaction mixture is heated to the desired reaction temperature and .... the more volatile reaction product or products are removed from the reaction mixture." Thus, in an esterification

reaction, water formed as a result of the reaction is removed from the reaction mixture. See specification, page 2.

In contrast to the aforementioned requirement of the claimed subject matter, Trambouze is directed to numerous, but dissimilar, chemical reactions. These reactions generally include hydrogenation, dehydrogenation, oligomerization and polymerization. See pages 1, 7 and 8. However, there is no specific teaching or suggestion of equilibrium reactions, such as esterification, transesterification, transacetalization or acetal forming reactions as required by the claimed subject matter. Nor do any of the specific reactions contemplated by Trambouze result in an equilibrium which may be driven forward by heating the reaction mixture to a desired temperature and removing a volatile product formed as a result of the reaction. See Trambouze, Figure 2. Based upon our findings, we conclude that Trambouze does not teach, nor would have suggested, chemical reactions which include the removal of volatile reaction products formed as a result of the reaction, wherein said reaction mixture has been heated to a desired reaction temperature. Accordingly, the disclosure of Trambouze fails to suggest the specific process step C of the claimed subject matter.

In the absence of the aforesaid volatile product removal step in Trambouze, the examiner relies upon the teaching of Buettgen. We find that Buettgen specifically teaches esterification reactions in which the water of reaction can be removed by distillation as required by the claimed subject matter. See column 2, lines 48 - 59. However, the process taught by Buettgen is directed to a dispersed catalyst system as opposed to the fixed bed catalyst system of the claimed subject matter. See Column 3,

Lines 21 - 26. Accordingly, Buettgen likewise is missing at least one required process step of the claimed subject matter, step B. Moreover, the examiner has not shown that a person of ordinary skill in the art seeking to solve the problem of removing a volatile product from an equilibrium reaction, such as an esterification, would reasonably be expected or motivated to combine a reference directed to the specific teaching of a hydrogenation reaction wherein no volatile products are formed or removed with a second reference directed to an esterification reaction.

The examiner must show reasons that the skilled artisan confronted with the same problems as the inventor and with no knowledge of the claimed invention would select the elements from the cited prior art references for a combination in the manner claimed. We determined that there is no reason, suggestion, or motivation to combine the references in the manner proposed by the examiner. Accordingly, the examiner has not established a

*prima facie* case of obviousness. See In re Rouffet, 149 F.3d 1350, 1357-1358, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998).

### DECISION

The rejection of claims 13 through 21, 36, and 37 under 35 U.S.C. § 103 as being unpatentable over Trambouze in combination with Buettgen is reversed.

The decision of the examiner is reversed.

REVERSED

BRADLEY R. GARRIS  
Administrative Patent Judge

CHUNG K. PAK  
Administrative Patent Judge

PAUL LIEBERMAN  
Administrative Patent Judge

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GLENN E.J. MURPHY  
HENKEL CORPORATION PATENT DEPT.  
2500 RENAISSANCE BOULEVARD  
SUITE 200

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GULPH MILLS, PA 19406